

Minister's Annual Report on Drinking Water | 2010



Protecting our environment.



Ontario

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ISSN 1920-6682 (Print)

PIBS 7785e

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Minister's Message



Safeguarding Ontario's drinking water is a priority for my ministry.

Ontario's approach focuses on protecting drinking water through a safety net that extends all the way from the source to the taps in the homes and workplaces of Ontarians. It is based on rigorous health-based standards, a strong set of laws and regulations, compliance, an emphasis on training and continuous improvement, and a network of partnerships and support for innovation.

In his recently released 2008-2009 annual report, Ontario's Chief Drinking Water Inspector confirmed that our safety net is

working very well. The report noted that 99.87 per cent of drinking water quality tests from municipal residential drinking water systems met our rigorous health-based standards.

Our success has grown out of an extensive network of partnerships across this province. We would not be able to achieve such strong results without the professionalism and dedication of the many owners and operators of drinking water systems in Ontario.

We have worked closely with these important partners to establish a licensing system for municipal drinking water

system owners and operators with an emphasis on continuous improvement and the implementation of recognized best practices.

Our focus begins at the source. We have facilitated the formation of locally-based source protection committees to prepare plans for safeguarding the watersheds from which we get our drinking water.

The innovative systems and clean water expertise that have been developed in government, as well as in Ontario's growing clean water technology sector and academic community, are now in high demand around the world.

Many parts of the world suffer from water scarcity and this situation is expected to get worse in the future due to climate change, a growing global population and ongoing industrialization and urbanization.

Even here in Ontario, with our abundance of fresh water, we can no longer take our water resources for granted.

The good news is that we have the know-how and the means to rise to this challenge and answer the global demand for innovative clean water technology.

That's why Bill 72, the proposed Water Opportunities and Water Conservation Act, 2010 was tabled in the legislature this year.

With this proposed act, we want to support the growth and expansion of Ontario's clean water technology sector and make our province a North American leader in this fast-growing segment of the environmental industry.

If passed, this would create good green jobs and support innovation in this export-oriented sector that already employs some 22,000 people in Ontario.

Just as importantly, it would ultimately benefit our own drinking water treatment and distribution systems as we develop even better technologies for our own use.

Ontario has come a long way since the drinking water tragedy of Walkerton a decade ago. Thanks to the work of our drinking water system operators, inspectors and other partners, we are in a leading position in this area. Our government wants to enhance that position by taking our innovative expertise to the next level.

This act would help us support the development of sustainable infrastructure and conservation planning in Ontario and the use of innovative approaches to solve our wastewater and stormwater challenges.

We would also like to provide Ontarians with the information they need in order to make wise choices when it comes to using water.

I am excited about the opportunities that lie ahead for us as we take on one of the most important issues of the next several decades. I know Ontario can be a leader in this area because of our many successes in drinking water management.

I would like to take this opportunity to thank our partners, including municipalities, industry, academia, local conservation authorities, First Nations, non-governmental groups and concerned residents. It is thanks to them that we have some of the best protected drinking water in the world.

Now we must bring the same energy, insight and teamwork to our efforts in water conservation and innovation.

I invite you to join us as we take on this next great challenge.



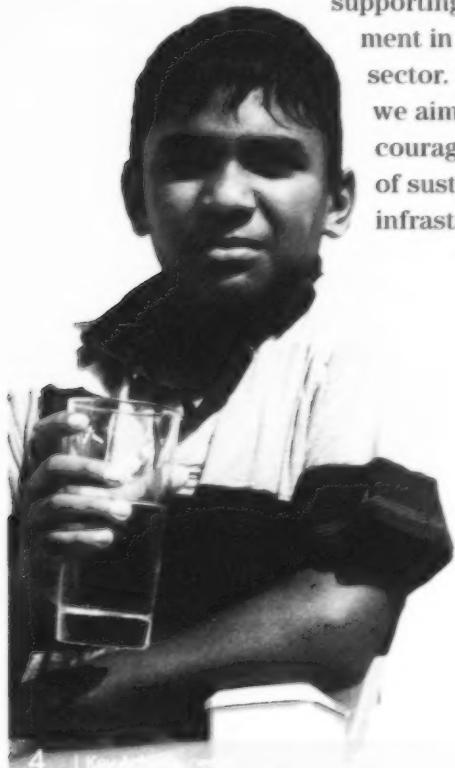
The Honourable John Wilkinson
Minister of the Environment
Government of Ontario
November 2010

KEY ACHIEVEMENTS from July 2009 to June 2010

Proposed Water Opportunities and Water Conservation Act, 2010

Bill 72, the proposed Water Opportunities and Water Conservation Act, 2010 was introduced on May 18, 2010. This groundbreaking act, if passed, would have three central aims. First, we want to turn Ontario into a North American leader in clean water technology by encouraging and

supporting investment in this key sector. Second, we aim to encourage the use of sustainable infrastructure



and conservation planning in this province. Third, we want to help Ontarians use water more efficiently by providing information on water use and conservation. My ministry will continue to consult with the public, municipalities and stakeholders as the legislation moves forward.

The Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem

The clean-up of Wheatley Harbour on Lake Erie was completed in April 2010 (see **Monitoring the Quality of Ontario's Water** for more information). I look forward to making similar announcements in the future for Jackfish Bay and Nipigon Bay on Lake Superior and the St. Lawrence River at Cornwall. We have also been working on reducing pollution as well as protecting and restoring aquatic habitats across the Great Lakes.

Cleaning up these and other environmentally damaged areas around the Great Lakes is one of our priorities under the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA).

Since 1971, the governments of Ontario and Canada have worked together under a series of such agreements to protect the Great Lakes. COA establishes an action plan and clear roles and responsibilities between federal and provincial ministries, and helps Canada meet its commitments under the Canada-U.S. Great Lakes Water Quality Agreement.

Our other key priorities under COA include reducing harmful pollution and dealing with lake-wide environmental issues including protecting and restoring aquatic habitats.

COA was extended for one year on March 31, 2010. This extension allows us to continue our joint efforts with the federal government around the Great Lakes while amendments to the bi-national agreement are negotiated. You can find more information on our efforts in this area at www.ontario.ca/healthygreatlakes.

October 2009 CCME Event in Kingston

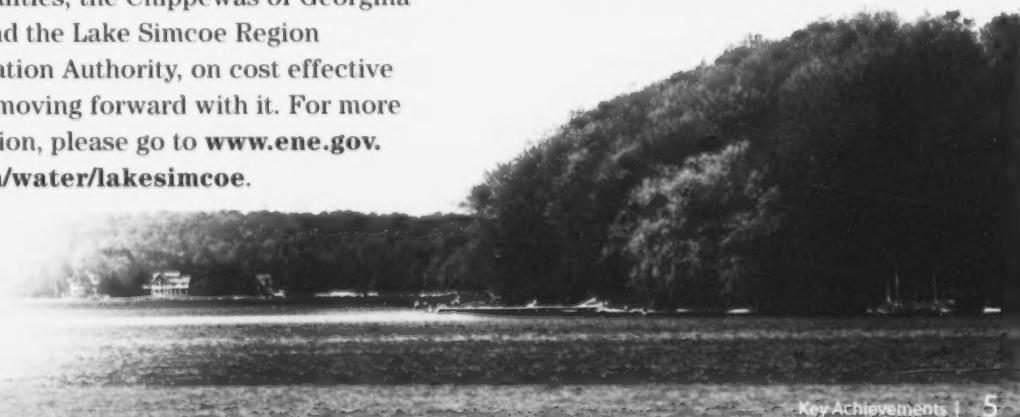
The rivers and lakes that provide our sources of drinking water know no borders. That is why my ministry cooperates closely on water issues with our counterparts in the federal government and the other provincial governments through the Canadian Council of Ministers of the Environment (CCME). Ontario had the pleasure of holding the CCME presidency in 2009. At the October 2009 summit in Kingston, we endorsed a Canada-wide strategic vision for water to help us ensure that all Canadians have access to enough clean water to meet their needs today and for generations to come. We committed to achieving this by using a sustainable watershed-based approach to protecting ecosystems, promoting water conservation by helping people understand the full value of water, improving the management of water quality and quantity, making sure that we are adapting to the reality of climate change and keeping Ontarians and Canadians informed on the key issues. The CCME also came out in support of a Canada-wide water efficiency labeling program to give consumers the information they need to buy the most efficient toilets, shower heads and taps on the market. For more information, please go to www.ccme.ca.

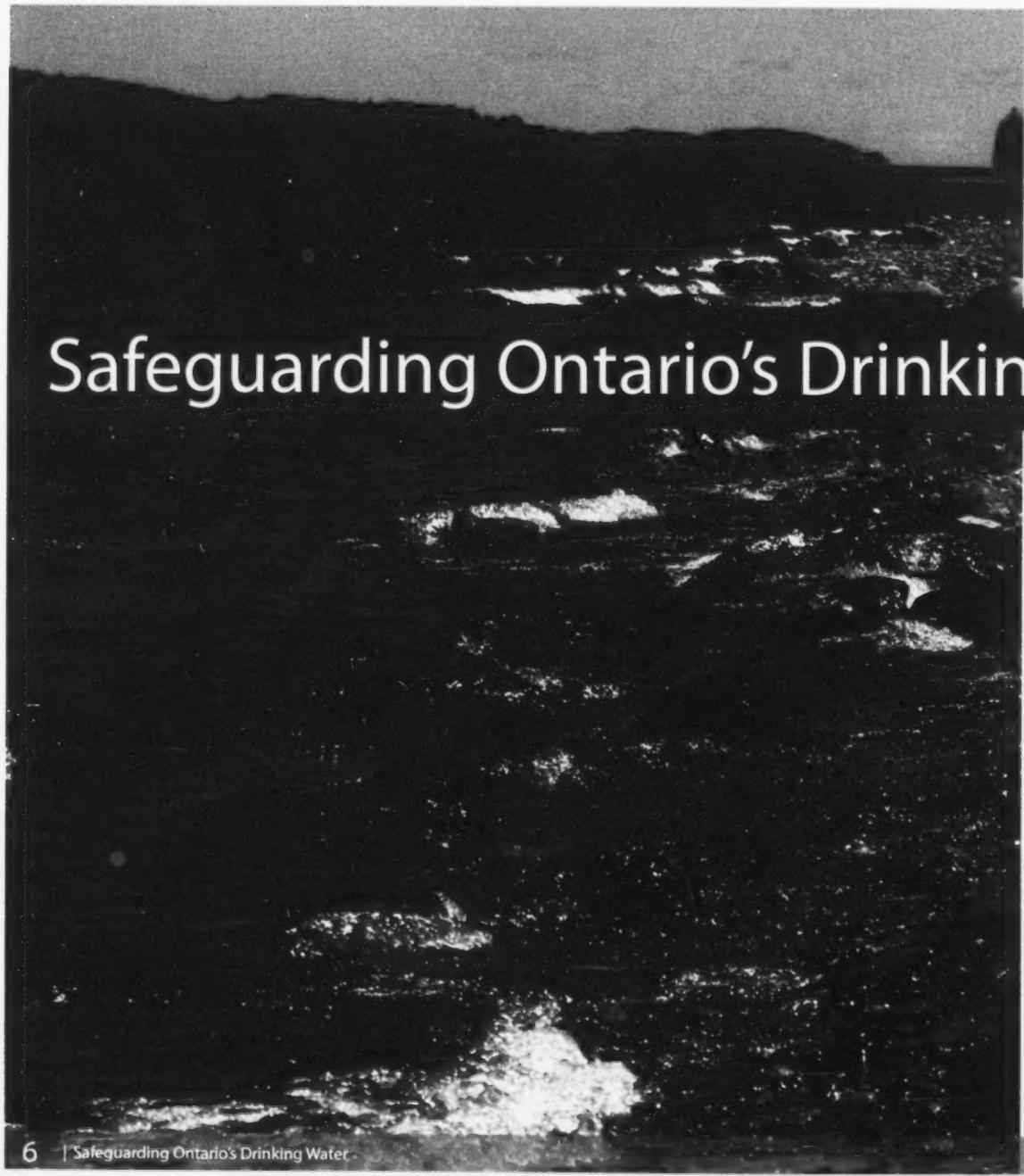
Lake Simcoe

Cleaning up Lake Simcoe is an important priority for my ministry. By June 2010 we had met all of our commitments for the first year of our Lake Simcoe Protection Plan, which was launched in June 2009. As part of the plan, we put together a long-term phosphorus reduction strategy, which aims to reduce phosphorus levels entering the lake from 72 tonnes per year to 44 tonnes per year. This will help increase oxygen levels, bring down excessive algae growth and restore a thriving coldwater fish community. We also began examining the feasibility of setting up a water quality trading system, which would enable us to adopt a market-based approach to reducing pollution in and around the lake. Our goals for Lake Simcoe are ambitious. So we will continue to work with our partners, including the federal government, the local municipalities, the Chippewas of Georgina Island and the Lake Simcoe Region Conservation Authority, on cost effective ways of moving forward with it. For more information, please go to www.ene.gov.on.ca/en/water/lakesimcoe.

Source Protection

Protecting the sources of our drinking water requires science as well as local knowledge of the watersheds of this province. As required under the Clean Water Act, Ontario's 19 source protection committees began submitting assessment reports on potential threats to drinking water sources in their areas in 2010. Meanwhile, over the past three years, our Ontario Drinking Water Stewardship Program has provided funding to more than 1,000 local projects to deal with threats to our drinking water sources as well as for education and outreach efforts. My ministry has also invited First Nations to join the source protection process. So far, the Kettle and Stony Point First Nation and the Six Nations of the Grand River have accepted this invitation. For more information, please go to www.ontario.ca/cleanwater.





Safeguarding Ontario's Drinking Water

Protecting the drinking water of Ontarians is one of my ministry's most important responsibilities. I am proud to say that there are a series of comprehensive measures to safeguard our drinking water in Ontario. The people of Ontario can have confidence in their drinking water thanks to the powerful safety net that we have put in place.

The safety net includes:

- Source-to-tap focus
- Strong legislative and regulatory framework
- Health-based standards for drinking water
- Regular and reliable testing
- Swift, strong action on adverse water quality incidents
- Mandatory licensing, operator certification and training requirements
- Multifaceted compliance improvement toolkit
- Partnership, transparency and public engagement

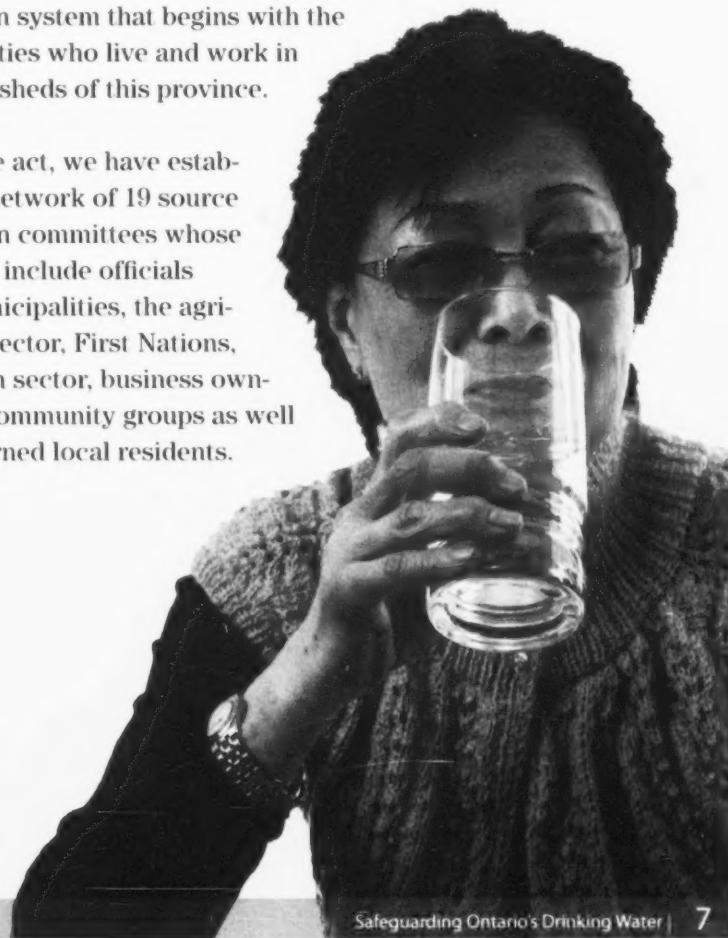
More information on our approach to protecting Ontario's drinking water as well as the performance of our drinking water systems can be found in the recently released *Chief Drinking Water Inspector's Annual Report for 2008-2009* at www.ontario.ca/drinkingwater.

Strong Legislative and Regulatory Framework

Source Protection

My ministry has put in place a powerful set of laws and regulations to protect the sources of our drinking water. The Clean Water Act serves as the foundation of a comprehensive protection system that begins with the communities who live and work in the watersheds of this province.

Under the act, we have established a network of 19 source protection committees whose members include officials from municipalities, the agricultural sector, First Nations, the health sector, business owners and community groups as well as concerned local residents.





Using scientific guidelines and consulting with the public, these committees have been working hard on assessment reports which map out areas of vulnerability, and potential threats to drinking water sources in their regions. Some of the committees have already finished this work and submitted their results to my ministry for review. The rest are expected to be done by the end of 2010.

As the reports are being reviewed in anticipation of their approval by my ministry, the committees will set to work on source protection plans for addressing the existing threats to the quality and quantity of source water as well as any potential future threats. As in previous stages of this process, the committees will be consulting with the public and interested groups as they prepare their plans.

Since the summer of 2009, my ministry has held extensive public consultations on a regulation that will guide the committees in preparing their source protection plans. This work was completed in the first half of 2010 and the requirements for the plans are now laid out in a new regulation (O. Reg 246/10) that amended the General Regulation under the Clean Water Act (O. Reg 287/07) which took effect on July 1, 2010.

As of March 31, 2010, my ministry and the Ministry of Natural Resources have invested more than \$170 million to support municipalities and conservation authorities as they go through this technical process.

As part of their assessment reports, the committees are examining the potential effects of climate change on their watersheds. This information will be invaluable for helping the committees and my ministry develop a strategy for dealing with the effects of this global problem on our water supply.



First Nations Participation in Source Water Protection

My ministry considers First Nations to be crucial partners in our efforts to protect the lakes, rivers and groundwater that serve as the sources of Ontario's drinking water.

Under the Clean Water Act, the councils of bands in a source protection area or source protection region must be offered the opportunity to name persons to represent them on the source protection committee. Up to three First Nations representatives can sit on the source protection committees and participate in the preparation of assessment reports as well as in the later work of developing a plan for dealing with potential threats.

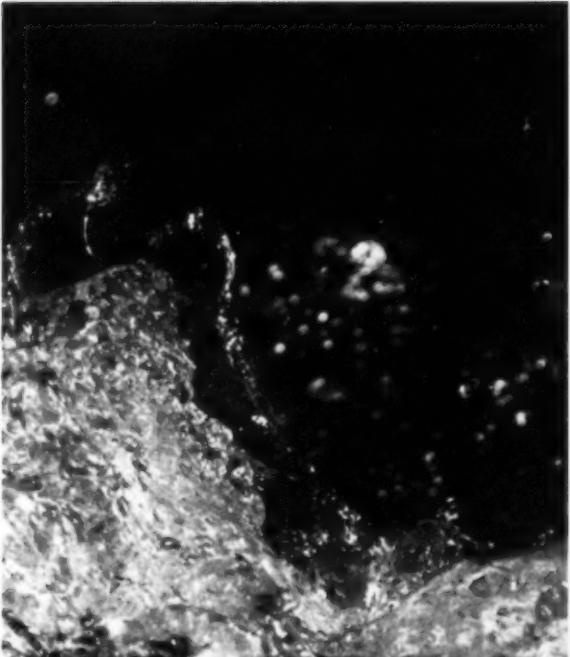
Two-thirds of the source protection committees with reserves in their regions currently have First Nations representatives on their committees. My ministry is providing funding of \$10,000 per year per eligible First Nation to give them the capacity to review assessment reports and source protection plans, hold public consultations in their community, and fund a community member to sit on the local source protection committee.

Under the Clean Water Act, First Nations with reserves in source protection areas may also request to have their drinking water systems included in the source protection planning process.

Two First Nations systems are now included in the planning and protection activities under the Clean Water Act.

More information is available at www.ontario.ca/drinkingwater/278092.pdf.





Drinking Water Surveillance Program

Along with our partners, we also run Ontario's Drinking Water Surveillance Program. This is a science-based monitoring program that looks at source water and treated drinking water quality with a particular focus on non-regulated drinking water quality and emerging contaminants. Developed by the ministry in 1986, this voluntary program is run in cooperation with participating municipalities. For more information please refer to the websites at www.ene.gov.on.ca/en/water/dwsp and www.ene.gov.on.ca/en/publications/dataproducts.



Monitoring the Quality of Ontario's Source Water

As part of our commitment to protecting drinking water at its source, my ministry collects and analyzes tens of thousands of samples from our water, sediment and aquatic life. You can find the most recent information on this work in the *Water Quality in Ontario Report 2008*, which was released in April 2009. It is available at www.ene.gov.on.ca/publications/6926e.pdf. We are now working on the Water Quality in Ontario Report 2010.

Learn More:

Great Lakes Monitoring Program –
www.ene.gov.on.ca/en/water/greatlakes/index.php

Provincial (Stream) Water Quality Monitoring Network Program –
www.ene.gov.on.ca/programs/5310e.htm and www.ene.gov.on.ca/en/publications/dataproducts

Provincial Groundwater Monitoring Network Program –
www.ene.gov.on.ca/programs/5311e.htm

Inland Lakes Monitoring Program –
www.ene.gov.on.ca/en/water/index.php#greatlakes

Lake Partner Program –
www.ene.gov.on.ca/en/water/lakepartner/index.php and www.ene.gov.on.ca/en/publications/dataproducts

Contaminant in Sport Fish Monitoring Program –
www.ene.gov.on.ca/en/water/fishguide/index.php

Ontario Benthos Biomonitoring Network –
www.svca.on.ca/download/benthos

Partners Taking Action on Lake of the Woods Water Quality

Protecting the lakes and rivers of this province often requires my ministry to forge partnerships with a wide range of different groups. Our work on restoring the water quality of Lake of the Woods is a good example. This lake serves as a critical source of drinking water, electricity, recreation, agriculture and fisheries for people in Ontario, Manitoba and Minnesota.

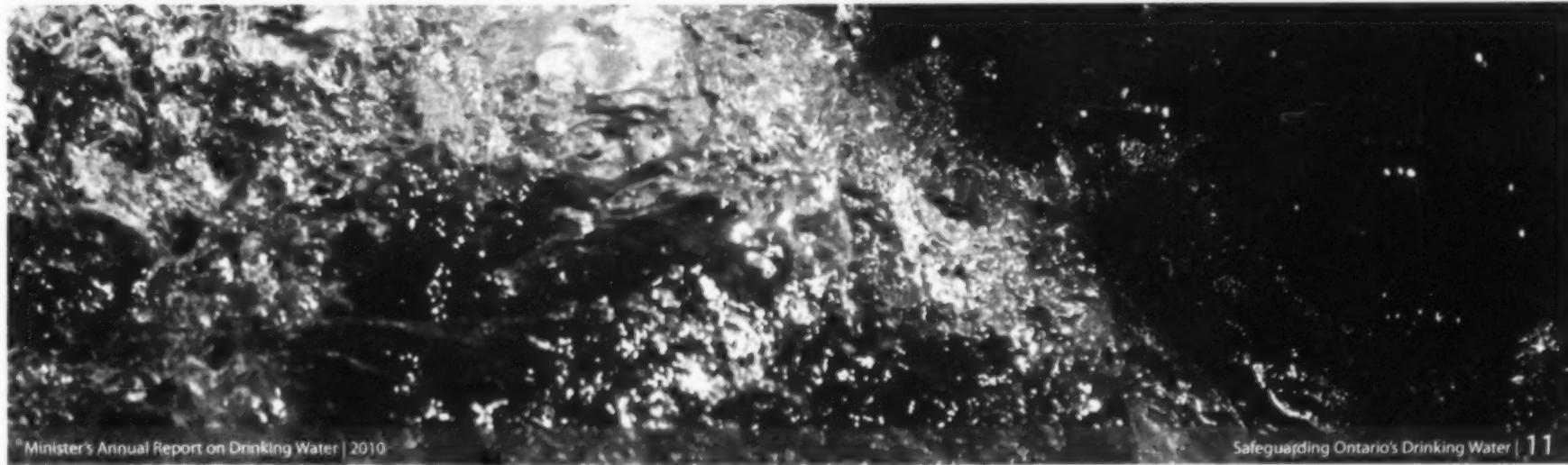
Unfortunately, the quality of the water, the health of the trout population and the physical beauty of the lake are being threatened by blue-green algae. The south end of the lake was recently included on Minnesota's Impaired Waters List because of high levels of nutrients for algae in the water, such as phosphorus.

In 2009, my ministry developed the Lake of the Woods Watershed Stewardship Strategy in response to public concern. Our aim is to ensure that those who use the lake are complying with environmental regulations. We also want to promote scientific

research, foster international cooperation and data sharing, raise public awareness and build partnerships with other concerned groups and organizations.

Our partners include resource agencies in Manitoba and Minnesota, the federal governments in Canada and the United States, the Ontario Ministry of Natural Resources, the Lake of the Woods Water Sustainability Foundation, First Nations, tribal communities and agencies in Canada and the United States, local health units, the Lake of the Woods District Property Owners' Association and a variety of other stakeholders in the watershed.

For more information on this issue, I encourage you to read the *State of the Basin Report for the Lake of the Woods and Rainy River Basin* produced by the Lake of the Woods Water Sustainability Foundation at lowwsf.com/progress-we-are-making/12-state-of-the-basin-report-released.pdf.



Lake Erie's Wheatley Harbour Cleaned Up

In April 2010, the governments of Canada and Ontario announced the completion of Lake Erie's Wheatley Harbour ecosystem restoration efforts. As a result, we were able to remove the harbour from our list of environmentally damaged areas around the Great Lakes. The water quality at the revitalized harbour has improved and the area is now home to an abundant and diverse community of fish and wildlife.

Wheatley Harbour and the adjacent Muddy Creek wetland, which are located just east of Point Pelee, were designated a Great Lakes Area of Concern under the Canada-U.S. Great Lakes Water Quality Agreement in 1985.

The harbour is a major freshwater commercial fishing port on Lake Erie that contributes millions of dollars annually to Ontario's economy, but this success had come at an environmental cost.

The area had been damaged by decades of wastewater discharges from fish and vegetable processing plants, which had contaminated the water and had led to the excessive growth of undesirable algae and a decline in the fish and wildlife populations.

Our government worked with Environment Canada, the Essex Region Conservation Authority, the Essex County Stewardship Network, local industry and others to improve the harbour's environment.

Thanks to our joint efforts aimed at reducing the impact of industrial waste water, agricultural run off, and other sources of pollution and improving the local habitat the quality of the water and health of the ecology at Wheatley Harbour and Muddy Creek has improved significantly.



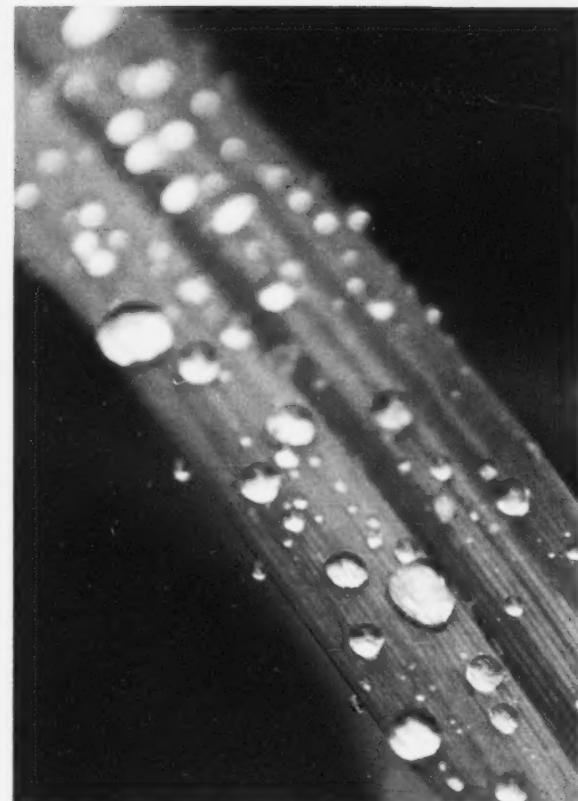
Monitoring the Effects of the Cosmetic Pesticides Ban

The sale and use of prescribed pesticides for cosmetic purposes on lawns, ornamental and vegetable gardens, patios, driveways and in parks and schoolyards have been banned in Ontario since April 22, 2009. The requirements of the ban are detailed in a regulation (O. Reg. 63/09) made under the Pesticides Act, which was amended by the Cosmetic Pesticides Ban Act. Now we want to see whether the amount of pesticides in our stream water has changed since the ban was put in place. To that end, my ministry has taken the lead in a study of several streams flowing through Ontario cities. The study compared a total of 168 stream water samples taken before and after the ban during the summers of 2008 and 2009. Preliminary results show a 78 to 86 per cent drop in concentrations of three pesticides that are estimated to have accounted for more than half the total amount used by lawn care companies in Ontario.

Monitoring the Effects of Road Salts

Road salt is a common sight on the streets, parking lots and sidewalks of Ontario's communities during the winter. While the salt helps to keep our roads and walkways safe by removing snow and ice, some of it also runs off into our streams and lakes or seeps into the groundwater. This can harm plants, animals and fish, and make drinking water taste salty.

My ministry keeps a close watch on this situation by monitoring levels of sodium and chloride from the salt in our groundwater, streams and lakes. We have found that salt levels in many of Ontario's lakes and streams have been gradually increasing over the last 40 years. We are working with road authorities in Ontario to reduce the amount of salt we are putting on our roads so that driving conditions remain safe while the impact on the environment is minimized.



World-Class Walkerton Clean Water Centre Training Facility



"To actually see this facility is overwhelming — it is spectacular."
~ Justice Dennis O'Connor

The Walkerton Clean Water Centre opening ceremony. From left to right Carol Mitchell, MPP for Huron Bruce; Justice Dennis O'Connor, the Commissioner of the Walkerton Inquiry; His Worship Charles Bagnato, Mayor, Town of Walkerton; Mr. Rui De Carvalho, Chair, Walkerton Clean Water Centre

Our drinking water safety net relies on the work of highly qualified drinking water system operators. That's why we place a lot of emphasis on making sure that our drinking water professionals receive the best possible training.

The permanent Walkerton Clean Water Centre was officially opened in June 2010. The newly expanded facility provides hands-on training using leading-edge treatment technology for the professionals who supply safe drinking water to homes and businesses across Ontario. It is also striving to be LEED (Leadership in Energy and Environmental Design) certified, through utilizing best practices in energy conservation and environmental efficiency.

The new facility will enable the centre to expand its operations and training program. Some of its key features include two additional training rooms that can provide conference space, a larger teaching laboratory and an expanded technology demonstration area with a pilot distribution system.

The Walkerton Clean Water Centre is an integral part of our efforts to provide safe and high quality drinking water for the people of Ontario.

For more information, I encourage you to visit www.wcwc.ca.

Municipal Licensing, Operator Certification and Training

My ministry continued to work closely with municipal residential drinking water system owners as we put in place our new mandatory licensing program. By the end of April 2010, we had issued 109 licences to 49 municipalities. Another 489 applications from 251 municipalities were being processed. All remaining licence applications were received by the ministry by June 2010.

The new licensing program introduced a rigorous Quality Management Standard that emphasizes continuous improvement. In order to receive a licence, all municipal drinking water system owners must adopt an operational plan that will enable them to stay focused on keeping up with the best practices in this part of the water sector. I am proud to say we were the first jurisdiction in North America to begin using this stringent approach to drinking water system licensing.

We have also put in place a rigorous training and certification program for our municipal residential drinking water system operators.

Like the licensing program, the certification process is based on a philosophy of continual improvement. It is not enough for our operators to go through the training once at the beginning of their careers. In order to hold on to their certification, they must upgrade their knowledge and skills with 20 to 50 hours of training every year. This gives my ministry the assurance that our operators are maintaining their skills and keeping up with the latest and best science in their field. As of the end of March 2009, there were 5,946 certified drinking water operators in the province holding 7,978 certificates.

The Walkerton Clean Water Centre plays a key role in the training of our drinking water system operators. As of March 2010, the centre had coordinated and delivered training to more than 23,000 course participants since it was launched in October 2004.

For more information, please go to www.wcwe.ca and www.ontario.ca/drinkingwater.



Drinking Water Performance Results – April 1, 2008 to March 31, 2009

Summary of Drinking Water Quality 2008-09

Ontarians can have confidence in the quality and safety of the water that flows from the taps in their homes and workplaces. Our regulated drinking water system owners and operators are required to send drinking water samples to licensed laboratories in order to make sure the water in their systems meets Ontario's rigorous health-based standards. I am proud to say that Ontario's drinking water system operators and owners, inspectors and licensed laboratories have once again performed extremely well this year.

The Ontario Drinking Water Quality Standards are an important component of the safety net. My ministry receives advice on those standards from an expert body of representatives of academia, industry and

municipalities known as the Advisory Council on Drinking Water Quality and Testing Standards. With the help of the council, we continuously review and update these standards to ensure that they reflect current scientific knowledge.

In 2008-09, Ontario's licensed laboratories submitted more than 600,000 microbiological, chemical and radiological drinking water test results from drinking water systems to the ministry. The results revealed that:

- 99.87 per cent of drinking water tests from municipal residential drinking water systems met the drinking water standards — consistently strong results over the past five years
- 99.40 per cent of drinking water tests from non-municipal year-round residential systems, such as mobile home parks, met the standards
- 99.38 per cent of drinking water tests from systems serving designated facilities, such as nurseries, schools and health care centres met provincial standards.



Inspections Summary for Drinking Water Systems and Laboratories

My ministry conducts inspections at our drinking water systems to ensure that owners and operators are complying with their legal and regulated obligations to provide safe and high quality drinking water to the public.



Key Findings of the Drinking Water Systems Inspections Program 2008-09

- All 700 municipal residential drinking water systems were inspected.
- In 2008-09, 84 per cent of municipal residential drinking water systems achieved inspection ratings over 95 per cent which is a 12 per cent increase over the past four years.
- The inspections led to 21 orders being issued to 18 municipal residential drinking water systems. In addition, four non-inspection orders were issued.
- A total of 36 orders were issued to 35 non-municipal year-round systems and systems serving designated facilities.
- No orders were issued in connection with the nine inspections of systems operated by Local Services Boards.



Key Findings of Licensed Laboratory Inspections 2008-09

My ministry also conducts comprehensive inspections of laboratories licensed to test drinking water to ensure they are performing as well as possible.

- All 52 licensed laboratories were inspected at least twice for a total of 117 inspections.
- Out of those inspections, 52 were announced, 52 were unannounced, and 13 were in response to a complaint or concern raised by a ministry staff member or an external source.
- Two orders were issued to two licensed laboratories.

Enforcement Activities Summary 2008-09

My ministry investigates and refers matters for prosecution where appropriate when drinking water system and licensed laboratory owners and operators are not complying with the law.

Drinking Water Prosecutions in 2008-09

- There were 13 cases involving convictions related to 14 drinking water systems, resulting in fines totaling \$131,800.
- Three of those cases involved four municipal residential systems and resulted in fines totaling \$42,000.
- Six of the cases involved six non-municipal year-round residential systems and resulted in fines totaling \$39,000.
- Four of the cases involved four systems serving designated facilities and resulted in fines totaling \$50,800.



Emerging Issues



More than half of Ontarians believe that fresh water is our most important natural resource. At the same time, people in Ontario may not be fully aware of the need to conserve and safeguard our water, since we have always had such a good supply virtually at our fingertips.

Water Conservation and Efficiency Trends in Ontario

The average person in our province uses about 267 litres of water every day, according to Environment Canada's 2010 Municipal Water and Wastewater Report. That's almost double the amount used in many European countries.

We need to do more to conserve this precious resource to ensure that we have abundant water supplies now and into the future. One of the most cost-effective ways to do this is to make sure that we are using our water as efficiently as possible.

The proposed Water Opportunities and Water Conservation Act, 2010 (Bill 72) which was introduced earlier this year, is designed to help us accomplish this.

If passed, the proposed legislation would enable us to make regulations requiring standardized information about water use on municipal water bills so that Ontarians can do their part to conserve water.

We would do our part under the act by requiring that prescribed public agencies

produce water conservation plans and that these agencies consider technologies, services or practices that promote the efficient use of water when acquiring goods and services.

If passed, the proposed act would amend the Building Code Act to require the Minister of Municipal Affairs and Housing to initiate reviews of the Building Code with reference to standards for water conservation.

We are also aiming to encourage municipalities to use innovative technologies and services to solve their water, wastewater and stormwater infrastructure challenges.

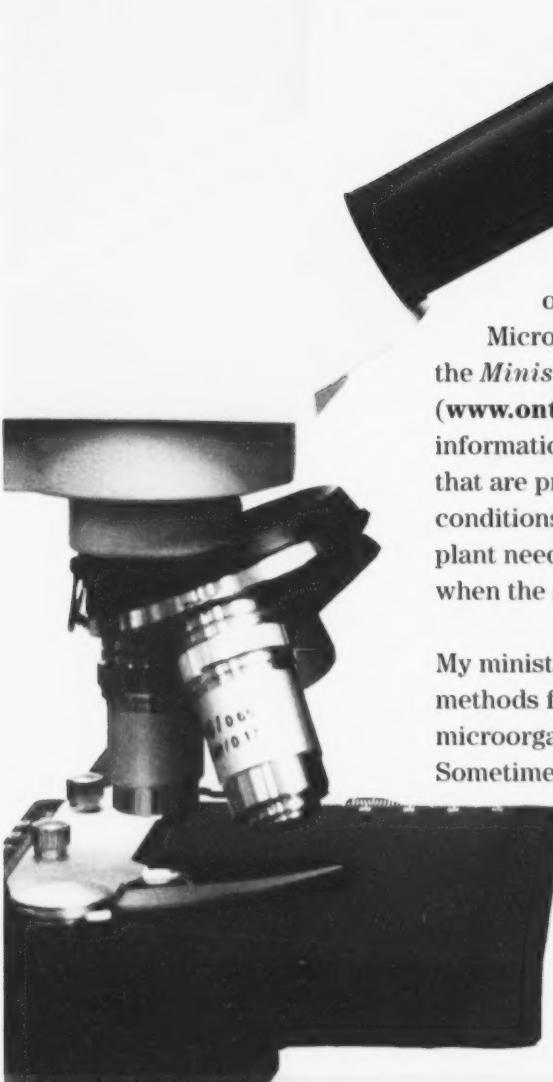
Water efficiency is the most cost-effective way to maximize drinking water and wastewater treatment capacity. The cost of conservation programs may be as little as a quarter of what it would cost to build new infrastructure.

The City of Guelph provides us with an excellent example with its approach to wastewater treatment. Rather than build a new

treatment plant at an estimated cost of \$30 million to meet its growing needs, the city invested \$1.5 million in optimizing the existing system, thus reducing its operating costs and improving regulatory compliance.



Microbial Source Tracking



My ministry is currently providing funds for research on the numbers and types of protozoa, viruses and bacteria in our lakes and rivers. This research will help us decide what kinds of additional treatment procedures, if any, might be needed in our water treatment plants. We will be carrying out this research using a tool called Quantitative

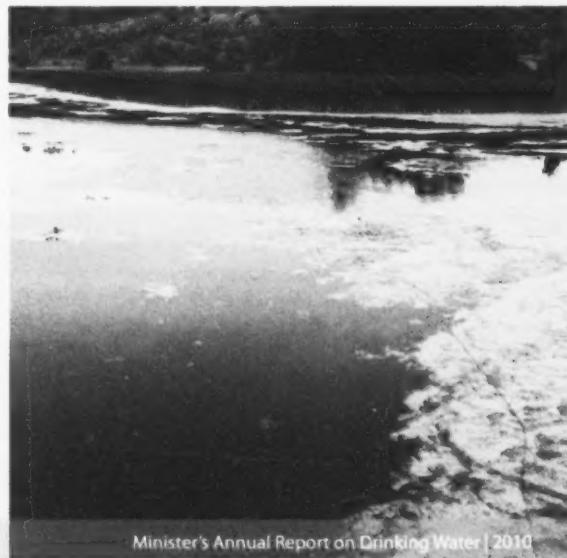
Microbial Risk Assessment, which was outlined in the *Minister's Annual Report on Drinking Water 2008* (www.ontario.ca/drinkingwater/254529.pdf). The information we gain on the number of microorganisms that are present in our source water under various conditions can help us understand how a water treatment plant needs to change its process after a heavy rainfall or when the snow melts in the spring.

My ministry is participating in research to develop methods for tracking down the source of these microorganisms (humans, farm animals and wildlife). Sometimes pollution can be controlled before it even enters the source water.

Algal Toxins

Blue-green algae, also known as cyanobacteria, are naturally present in lakes and rivers. Normally, they are barely visible, but when conditions are favorable, algae populations can increase quickly and form a large mass called a bloom. While many types of cyanobacteria are harmless, some types can produce toxic substances known as cyanotoxin or algal toxins.

In 2010, we started to use a new monitoring technique known as Enzyme-Linked Immunosorbent Assay to screen for certain types of cyanotoxins called microcystins. This technique is much faster and less expensive than traditional laboratory



methods and will allow more samples to be processed at a lower cost. We will be reporting the first results of this method in the near future.

We have been monitoring untreated source water as well as drinking water for cyanobacteria related toxins since 2004. The tests show that our drinking water meets the Ontario Drinking Water Quality Standard, although we have found low levels of cyanotoxins in untreated samples taken from some rivers and lakes.

In April 2010, we joined Environment Canada, municipalities, public health officials and conservation authorities in the Bay of Quinte on Lake Ontario to create the Shoreline and Safe Drinking Water Project.

This project will determine where and how frequently the algal blooms occur and what is causing them. It will also assess the levels of algae-related toxins in the bay, help municipalities identify the blooms and offer information to the public on the best ways of dealing with the situation. For more information please refer to www.ene.gov.on.ca/cons/5088.pdf and www.ene.gov.on.ca/cons/5087.pdf.

Reducing Disinfection By-Products

My ministry has completed a two-year study that will help municipal drinking water system operators reduce the formation of chemical by-products during the water treatment process.

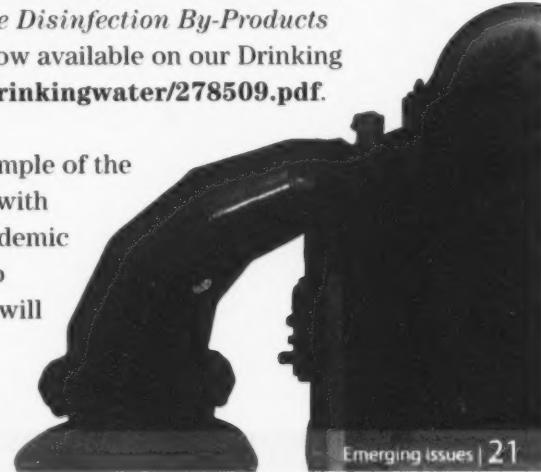
The study was conducted in partnership with drinking water system operators, academics and industry. It focused on reducing the amount of trihalomethanes and haloacetic acids that may form during the disinfection of water and may be harmful to human health.

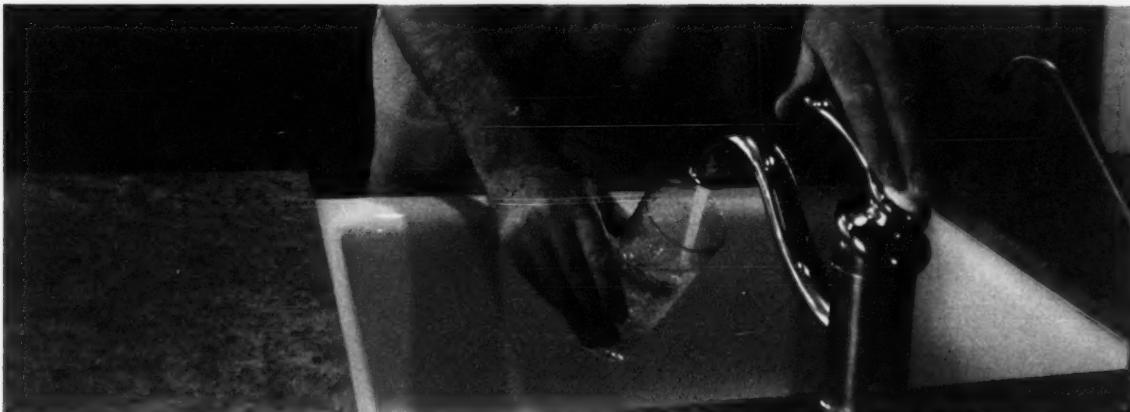
The results showed that we could reduce these chemicals without affecting the disinfection process by using various strategies for optimizing the coagulation process.

These strategies were tested at three small municipal residential drinking water systems. All three systems reported improvements in water quality. Moreover, these strategies were put into practice without any capital investment.

My ministry has put together a user guide in consultation with the operators and inspectors of small municipal residential drinking water systems. The guide, entitled *Strategies for Minimizing the Disinfection By-Products Trihalomethanes and Haloacetic Acids*, is now available on our Drinking Water Ontario website at www.ontario.ca/drinkingwater/278509.pdf.

This study and the resulting guide is one example of the strong partnerships my ministry has formed with both the drinking water industry and the academic community. We hope the guide, in addition to improving the water quality in our province, will facilitate dialogue between drinking water system operators, inspectors and engineers.





Innovative Nanofibre Membrane Technology

My ministry is currently conducting scientific studies to support the development of cutting-edge nanofibre membrane technology that will allow us to produce clean water at a lower cost and with less impact on the environment than existing technologies. The idea was first developed here at the ministry and we are now working on it in partnership with scientists at the University of Ottawa, the Walkerton Clean Water Centre and the National University of Singapore.

These membranes can remove pollutants such as pharmaceuticals, volatile organic compounds and disinfection by-products with about the same effectiveness as conventional membrane systems but at much smaller module sizes. So far, laboratory tests of the new membranes have achieved removal efficiencies of 90 per cent or higher.

At the onset of the project, two students from the National University of Singapore travelled to Ottawa to assist in setting up the experiments. The project continues to help student researchers complete the requirements for their graduate degrees while helping us develop this new technology. Findings from the research have been published in four peer-reviewed science journals and presented at a number of national and international conferences.

Climate Change Adaptation

Climate change is going to have a major impact on our rivers, lakes and groundwater. My ministry is taking the situation seriously by carefully examining how our water will be affected and preparing ourselves to adapt to deal with those effects. Climate change is likely to cause alterations in our aquatic ecosystems as well as in the quality and quantity of our water.

It is critically important for us to be ready to adapt to these changes. That's why the Ontario Expert Panel on Climate Change Adaptation was established in 2007. After holding extensive consultations, the panel released a report containing recommendations for adapting to climate change in November 2009.

The report, which offers several key recommendations related to water, can be found at news.ontario.ca/ene/en/2009/12/report-from-the-expert-panel-on-climate-change-adaptation.html. My ministry will be using this report to develop ways to adapt to climate change.

Pharmaceuticals

My ministry recently completed two monitoring surveys for pharmaceuticals and other emerging contaminants.

The first survey was on treated drinking water and untreated source water. The pharmaceuticals we monitored for were either not found in the treated drinking water or rarely detected. The levels detected were well below any maximum acceptable daily intake for drinking water. Details on our findings can be found

on our website at www.ene.gov.on.ca/publications/7404e.pdf.

The second survey was a collaborative study with Trent University on monitoring for pharmaceuticals in the Great Lakes. The study investigated the use of a new sampling approach for monitoring these substances in surface waters. It contains information on the concentrations of pharmaceuticals at selected nearshore locations of the Great Lakes.

The results showed that some pharmaceuticals were present at trace levels in Great Lakes surface waters, with concentrations comparable to other studies of surface waters in North America and Europe. An article was published on the findings of this study in *Environmental Toxicology and Chemistry* (Vol. 29, No. 4, 23 December 2009, pp. 751-762).



Broader Water Agenda



We are living in a time of incredible strain on our planet's water supplies.

Population growth, ongoing urbanization and industrialization as well as climate change are creating a supply and demand problem of unprecedented proportions. It is estimated that within the next 20 years, the global demand for clean water is expected to exceed supply by 40 per cent. Responding to this challenge is going to take foresight, planning and ingenuity.

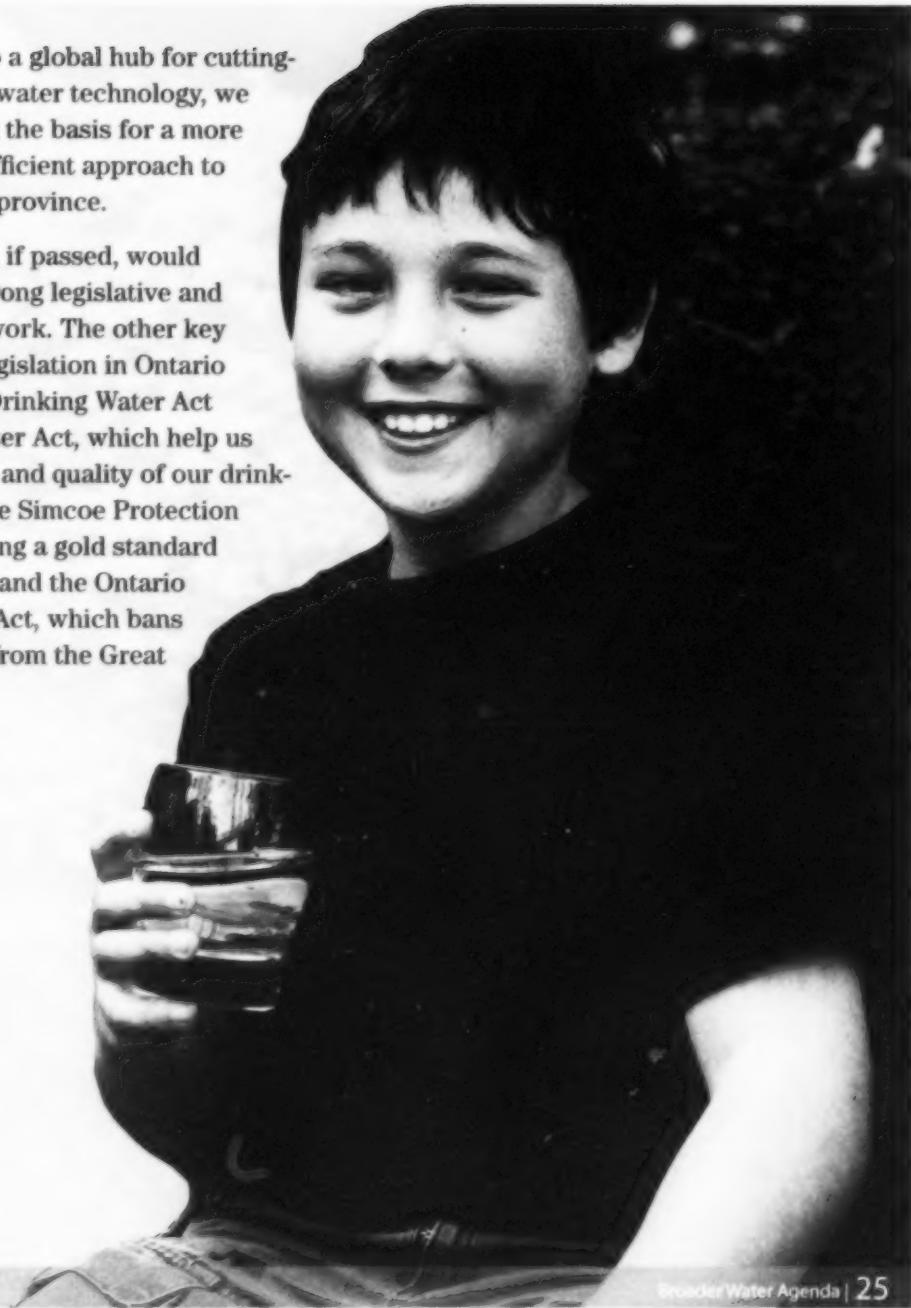
Ontarians have the capacity and the knowledge to lead in the development of solutions to this global challenge. Our government wants to help put this province at the forefront of the global water challenge with Bill 72, the proposed Water Opportunities and Water Conservation Act, 2010.

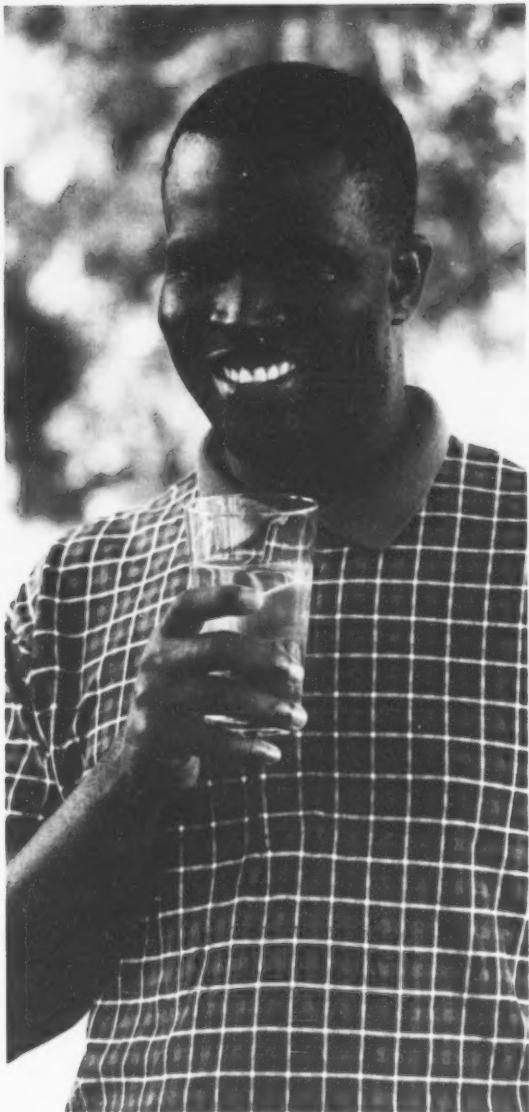
The central vision of this proposed act is to turn Ontario into a North American leader in the development and sale of technologies and services for water treatment and water conservation. The proposed legislation includes a new Water Opportunities Act, 2010 which if passed by the Ontario Legislature, would create a non-crown corporation called the Water Technology Acceleration Project, which would support research and development as well as the commercialization of new technologies and services in Ontario's water sector.

This new corporation would bring together government, industry and academia to support the creation and growth of globally competitive companies, and support Ontario-based technological innovation through marketing and global outreach.

In making Ontario a global hub for cutting-edge research on water technology, we would be creating the basis for a more sustainable and efficient approach to water in our own province.

The proposed act, if passed, would build upon our strong legislative and regulatory framework. The other key pieces of water legislation in Ontario include the Safe Drinking Water Act and the Clean Water Act, which help us protect the safety and quality of our drinking water, the Lake Simcoe Protection Act, which is setting a gold standard for sustainability, and the Ontario Water Resources Act, which bans water diversions from the Great Lakes Basin.





Closing Message

It is important to protect our water resources by making sure we are using them as efficiently as possible and striving to conserve what we have for our children and grandchildren. The availability of clean and safe drinking water is a vital foundation of our quality of life in this province. It is also one of the most important responsibilities of my ministry. I would like to assure Ontarians that we will continue to work with our many partners to provide safe and high quality drinking water, and ensure that we continue to do so for generations to come.



Glossary

Adverse Water Quality Incident: an event in which a municipal or private drinking water system receives an adverse test result. This can trigger a process of notification and corrective measures.

Benthos: insects, worms, crustaceans and other organisms without a backbone that live in, on, or near the bottom of water bodies.

Climate Change Adaptation: use of adaptation strategies to address the impacts of climate change in our communities and our ecosystems; reduce the negative impacts of climate change; and take advantage of new opportunities and technologies.

Coagulation: the addition of coagulant chemicals to water to allow for the agglomeration of the small suspended particles into larger particles that can be removed by sedimentation and filtration in the drinking water treatment process.

Conservation Authorities: local watershed management agencies that deliver services and programs that protect and manage water and other natural resources in partnership with government, landowners and other organizations
www.conservation-ontario.on.ca.

Contaminant: any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of these resulting directly or indirectly from human activities that cause or may cause an adverse effect.

Groundwater: the supply of fresh water found beneath the earth's surface, usually in aquifers that supply wells and springs.

Haloacetic Acids (HAAs): a by-product of the process used to disinfect drinking water. They are formed when chlorine reacts with natural organic matter in the water. HAAs typically have an element such as chlorine or bromine present in their makeup.

Local Services Boards: a community in areas of Northern Ontario without municipal structure. Local Services Boards are defined and governed by the Northern Services Boards Act administered by the Ministry of Northern Development and Mines. Drinking water systems run by Local Services Boards are generally categorized as non-municipal year round residential under O.Reg. 170/03.

Microorganism: an organism so small that it cannot be seen without a microscope, including bacteria, protozoa, fungi, viruses and algae.

Municipal Residential Drinking Water Systems: municipally-owned systems that serve more than five private residences, as well as systems under contract with a municipality to supply drinking water to more than five private residences.

Non-Municipal Year-Round Residential Systems: non-municipal drinking water systems (other than non-municipal seasonal residential systems) that serve a major residential development (more than five private residences) or a trailer park or campground that has more than five service connections.

Ontario Drinking Water Quality Standards: regulated standards (O.Reg. 169/03, Ontario Drinking Water Quality Standards made under the Safe Drinking Water Act) for microbiological, chemical and radiological parameters that, when present above certain concentrations in drinking water, have known or suspected adverse health effects and require corrective action.

Operational Plan: a document based on the requirements of the Drinking Water Quality Management Standard. The plan will document the owner and operating authority's quality management system.

Source Water: untreated water in streams, rivers, lakes or underground aquifers which is used for the supply of raw water for drinking water systems.

Surface Water: waters (except groundwater) that are on the land surface, such as lakes, ponds, rivers, streams, creeks and marshes.

Systems Serving Designated Facilities: drinking water systems that serve designated facilities such as schools (elementary and public), universities, colleges, children and youth care facilities (including day nurseries), health care facilities, children's camps and delivery agent care facilities (including certain hostels).

Watershed: a region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water.



Protecting our environment.

